



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 158(3) EPC

(43) Date of publication:
29.08.2001 Bulletin 2001/35

(51) Int Cl.7: **F16B 19/10, B29C 45/14,
B60R 13/02**

(21) Application number: **99949022.0**

(86) International application number:
PCT/ES99/00324

(22) Date of filing: **13.10.1999**

(87) International publication number:
WO 00/28223 (18.05.2000 Gazette 2000/20)

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**

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(30) Priority: **06.11.1998 ES 9802337**

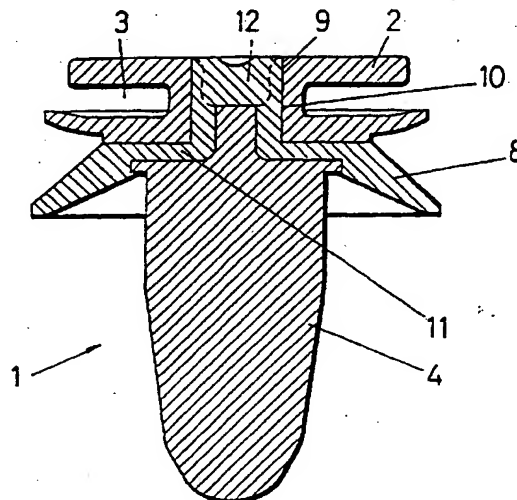
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(54) **CLAMP FOR FIXING PLATES AND PROCESS FOR THE FABRICATION OF SAID CLAMP**

(57) Clip being constructed by combining a base body (1), plastic in nature, of noticeable stiffness, with the standard head (2) for coupling to the plate to be fastened, and the also standard locking boss (4) which can contract elastically, intended for coupling into the hole in the sheet or plate acting as support, and a collar (8) preferentially of rubber or similar material, serving as sealing element, formed between head (2) and locking boss (4), having the special characteristic that the base

body (1) includes in the outside part of its head (2) an axial access (9) with channels (10) which are elbowed outwards and open into a perimetric neck (7) made in the section where the collar (8) is formed, all of the foregoing being such that first the base body (1) is injected into the mould corresponding and, afterwards, the collar is obtained in an over-moulding operation, in a second mould in which the previously obtained base body (1) participates.



O-P
FIG.12

Description

OBJECT OF THE INVENTION

[0001] The present invention relates to a clip which has been specially designed for fastening two plates of reduced thickness, attached face to face, that is mounted in parallel or appreciably parallel arrangement, with a slight separation between them.

[0002] The clip proves particularly appropriate for fastening a panel of interior lining to bodywork of a motor vehicle.

[0003] The invention also concerns the procedure for manufacturing said clip.

[0004] The object of the invention is to achieve a clip which in addition to satisfying its classical function as a means of fastening one plate to another, ensures a perfect seal in the coupling of the clip itself to the plate supporting it.

BACKGROUND TO THE INVENTION

[0005] Special application clips are known for use in the circumstances mentioned above, having a one-piece structure, plastic in nature, in which there is a head provided with a neck of suitable width for the thickness of the plate to be fastened, and an expandable locking boss, in the general form of a truncated cone, with a recessed step in the segment close to the head, so that this boss can be press-fitted, by elastic deformation of the same, into an orifice operationally made in the supporting sheet or plate, so that after fastening the clip to the first plate, coupling to the supporting plate proves practically instantaneous by simply pushing from the front.

[0006] On occasions it is desirable for the coupling to the supporting plate to be watertight, and in this sense is known, for example, the fastening device described in Spanish utility model 8700162, in which the clip, while maintaining its one-piece character and also the structure described above insofar as the head and the locking boss are concerned, incorporates between these elements a collar with a truncated cone shape which in the position of final attachment is deformed against the supporting plate to achieve the intended seal.

[0007] This seal, however, proves in practice to be very deficient, for two different and complementary reasons:

- Since the collar forms one piece with the rest of the clip and since the clip as a whole has to be made of a relatively stiff material, its capacity for deformation is slight and the crystallisation with time of the plastic material provokes a loss of elasticity which, in turn, results in a loss of watertightness.
- The actual shape of the clip requires the use of two half-moulds in its production process, so that corre-

sponding to the union between the two half-moulds, burring occurs which prevents the correct seating of the collar against the supporting plate and which, as a consequence, also impairs the seal.

[0008] A different solution to the problem is that demonstrated in Spanish utility model 9200507, which also starts with the basic approach to clip structure insofar as the head and its locking boss are concerned; in this case, a washer is fitted to the internal partition of the head, said washer acting as a watertight seal and being over-moulded on top of said head.

[0009] This solution partly overcomes the problems outlined above, since although it permits the use of two different materials, one for the clip itself and the other for the watertight washer, in which respect it is possible to make use of the most suitable material, it continues to be necessary to make use of two half-moulds to produce the washer in question, bringing with it the same problem as before with respect to burrs occurring in correspondence with the joint where said half-moulds meet.

DESCRIPTION OF THE INVENTION

[0010] The clip proposed in the invention has been designed and structured in order to overcome the aforementioned problems in a fully satisfactory manner.

[0011] To this end and more specifically, said clip retains the properties of the utility model 9200507 mentioned insofar as it is comprised of two different types of material, one constituting the clip itself and the other constituting the watertight seal, but has the special particularity that said seal is implemented in the form of a collar which, instead of being attached to the outside of the head, fits into an operationally formed neck made between the head and the locking boss.

[0012] Moreover, the collar is moulded on the base body forming the clip itself, but through channels defined in this base body, having axially positioned access to the same, so that the injection of the material of which the collar is composed is done through said axial access in the base body, which permits a totally different type of mould to be employed, free of joints, obtaining thereby a collar which, in addition to being perfectly incorporated into the rest of the clip, is without seams or burrs that could impair it from the point of view of a watertight seal, the latter resulting perfect.

[0013] In accordance with the foregoing, the manufacturing process of the clip starts with obtaining, in a first moulding stage, the base body of the clip from a semi-rigid plastic material and employing a standard mould, however with the special particularity that, as already stated, in this first moulding stage an axial access is formed in the base body at the level of the free end of the head, which immediately thereafter is split into two channels which are elbowed outwards at ninety degrees and which open into the neck planned for constituting

the collar.

[0014] Thereafter, in a second stage of moulding, the base body is inserted into a second mould, suitably adapted for this purpose, in which is produced (the collar??) possibly from rubber or any other adequate material, it being possible for this second mould to be of one piece insofar as the void where the collar is constituted is concerned, inasmuch as the reception of the material is produced axially, as already mentioned, and inasmuch as its nature (rubber or the like) permits the necessary deformation of said collar in its de-moulding in the final extraction of the piece.

DESCRIPTION OF THE DRAWINGS

[0015] To complement the description being made and with the object of assisting in a better understanding of the features of the invention, In accordance with a preferred example of a practical embodiment of the same, a set of drawings is attached to this description, said drawings forming an integral part thereof, in which in an illustrative and not restrictive manner, the following is shown:

[0016] Figure 1. - Shows a drawing of a side elevation of the base body which forms part of the plate fastening clip which constitutes the object of the present invention.

[0017] Figure 2. - Shows a transverse section of the piece of the previous figure made on the plane of line A-B of said figure.

[0018] Figure 3. - Shows another transverse section of the base piece made, in this case, on the plane of line C-D of figure 2.

[0019] Figure 4. - Shows another detail in section of the same piece, in this case, on the plane of line E-F of figure 1.

[0020] Figure 5. - Shows a further section of the same piece made at a different level, in this case, on the plane of line G-H of figure 3.

[0021] Figure 6. - Shows a side elevation of the collar that completes the base piece of the preceding figure.

[0022] Figure 7. - Shows a transverse section of the same collar made on the plane of line I-J of figure 6.

[0023] Figure 8. - Shows another transverse section of the same collar, but in this case made on the plane of line K-L of figure 7.

[0024] Figure 9. - Shows a top view of the same collar of figures 6 to 8.

[0025] Figure 10. - Shows a side elevation of the clip as a whole, that is, with the two pieces shown in the preceding figures duly assembled.

[0026] Figure 11. - Shows a diametric section of the assembly shown in the previous figure, made on the plane of line M-N of said figure.

[0027] Figure 12. - Shows another view in diametric section of the same assembly shown, in this case made on the plane of line O-P of figure 11.

[0028] Figure 13. - Shows a top view of the clip of figure 10.

[0029] Figure 14 and 15. - Each show, finally, illustrations corresponding to the injection phase of the collar of rubber or similar material, by over-moulding on the base body.

PREFERRED EMBODIMENT OF THE INVENTION

[0030] From the attached figures it can be seen how the clip proposed is built on a base body referred to throughout as (1), said body being obtained by means of an injection process based on a relatively stiff, plastic material, which defines, as in standard practice, a head (2) with a neck (3) for coupling to the plate to be fastened and extending into a locking boss (4), capable of contracting elastically, hollow and provided with side arms (5) which, with the classic truncated cone arrangement to facilitate the insertion of the boss into the fixing hole of the supporting plate, also incorporate the standard recessed step (6) for locking over said hole once the head (4) as a whole has passed through it.

[0031] This basic piece (1) has the special feature of incorporating, between its head (2) and its base body (1), a perimetral neck (7) for the formation, by over-moulding, of the collar (8) shown in figures 6 to 9.

[0032] In addition the basic piece (1) also has an axial access (9) in the outer section of its head (2), which forks into two channels (10) which have their extremities (10') elbowed outwards and which open into the aforementioned neck (7), these channels (10-10') constituting, through the access (9), the means for conducting the material that forms the collar (8) in the over-moulding operation of said collar and as is illustrated in figure 14.

[0033] With respect to the collar (8) mentioned, which as already stated shall be obtained by making use of rubber or a similar material, offering a high factor of elasticity, it has the form of a truncated cone necessary for it to perform its function as a sealing element, by being deformed against the supporting plate, and, as well as this truncated cone segment (8) constituting the collar itself, it also incorporates in the form of a one-piece structure, ribs (11) which converge on an external boss (12), said ribs being obtained as a result of filling the channels (10) and (10') of the base body (1), in the aforementioned over-moulding operation.

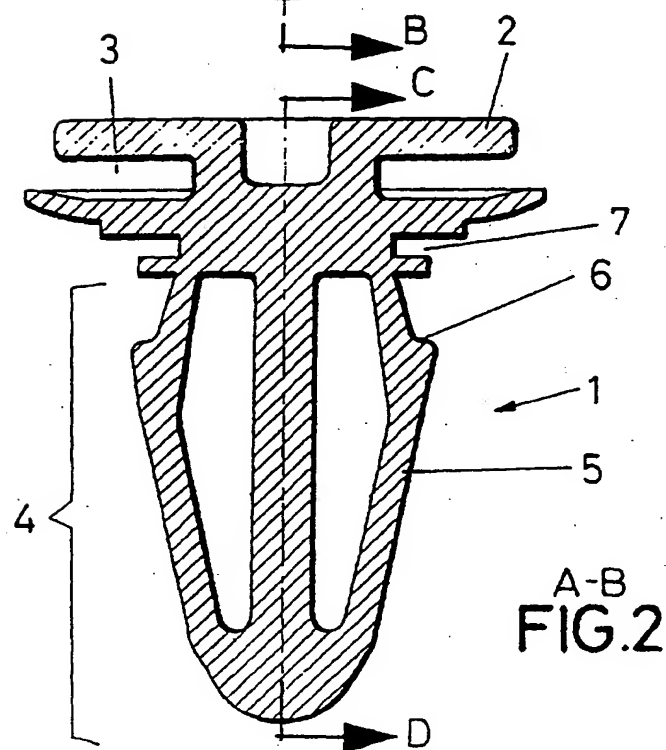
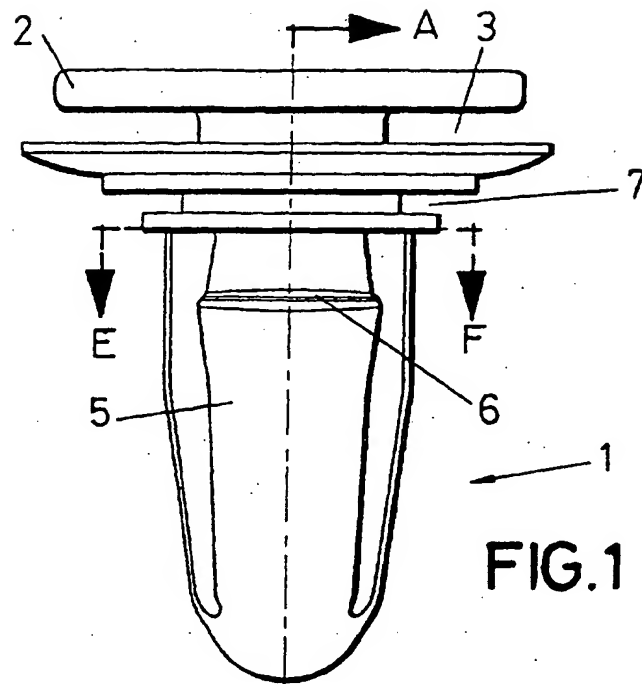
[0034] In the figure 14, it can also be seen how, after injection of the basic piece (1), this is inserted in a second mould (13), collaborating with the latter in shaping the void (14) for obtaining the collar, the injection head (15) being applied to the axial access (9) in the head (2) of the basic piece (1) itself.

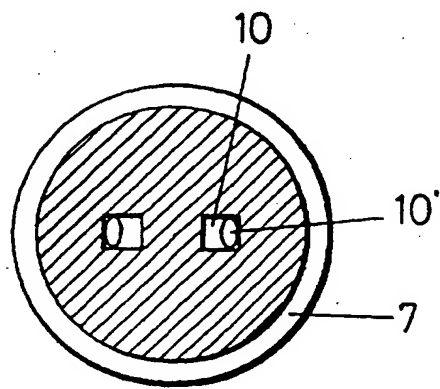
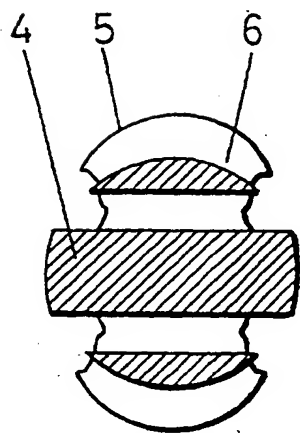
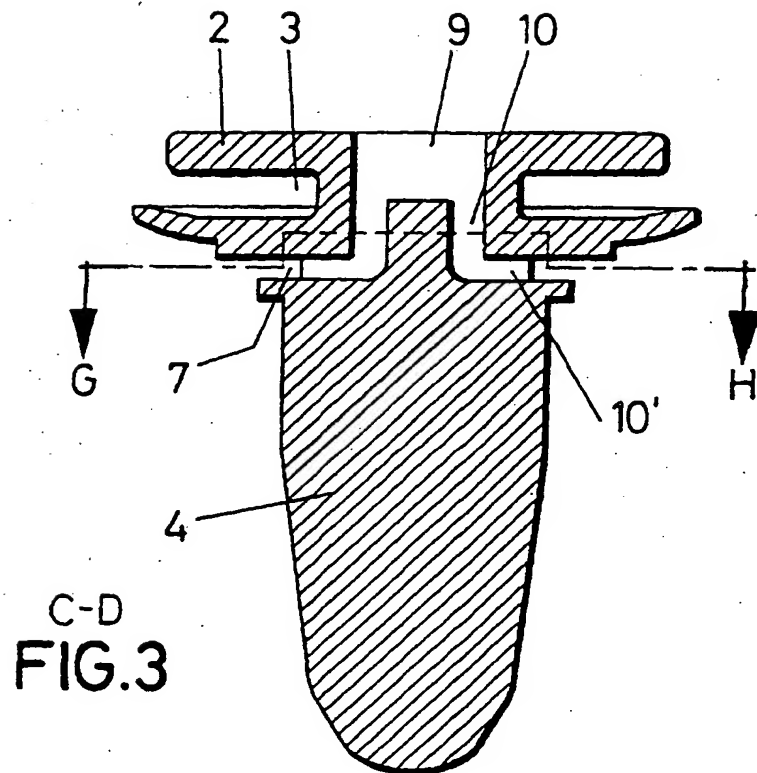
[0035] In this manner, as can be seen from figures 10 to 13, a clip is obtained which has practically a one-piece structure due to the over-moulding of the collar onto the base body and in which two elements participate which have totally distinct properties, one being of rubber or similar material and the other of noticeably stiff plastic, with a perfect finish for said collar (8) which, together with its inherent nature, ensures perfect sealing of the

clip against the plate or sheet to which it has to be fastened.

Claims

1. Fastening clip for plates, of the type which incorporates a head which comes with means for fixing the plate to be fastened, with a locking boss which can contract elastically, having a shape which converges towards its free end and having in the proximity of the head a stepped recess to serve as the locking mechanism in the hole in the supporting sheet or plate, as well as with a sealing washer in the area where head and locking boss converge, **characterised in that** it is constructed using two pieces which are independent and of different natures, a base body (1) being of a noticeably stiff plastic nature, which configures the head and the locking boss, and a sealing washer (8), preferably of rubber or similar material, it having been planned that the base body (1) in the area where its head (2) and locking boss (4) converge, incorporates a perimetral neck (7) into which fits the inside edge of the collar (8) which constitutes the watertight seal.
2. Fastening clip for plates, in accordance with claim 1, **characterised in that** the base body (1) includes in its head (2) an axial access (9) which forks into two channels (10), with terminating segments (10') elbowed outwards and which open into the bottom of the neck (7), whilst the collar (8) includes as an extension to its inside edge, ribs (11) terminated in an external boss (12), which fill the access (9) and the channels (10-10') of the base body (1), base body and collar being thereby fixed to each other as practically a one-piece structure.
3. Procedure for manufacturing the clip in accordance with the foregoing claims, **characterised in that** in a first operational step injection of the base body (1) is carried out, in a first mould, and in a second operational step, in which use is made of a second mould, in the core of which mould the base body (1) itself participates, the injection of the collar (8) is done by applying the injection head (15) with the material of which said collar (8) is made, to the axial access (9) of the base body (1), filling, in this operational step, with the material constituting the collar (8), both the mould housing (13) corresponding to said collar and the access (9) with the channels (10-10') of the base body itself (1).





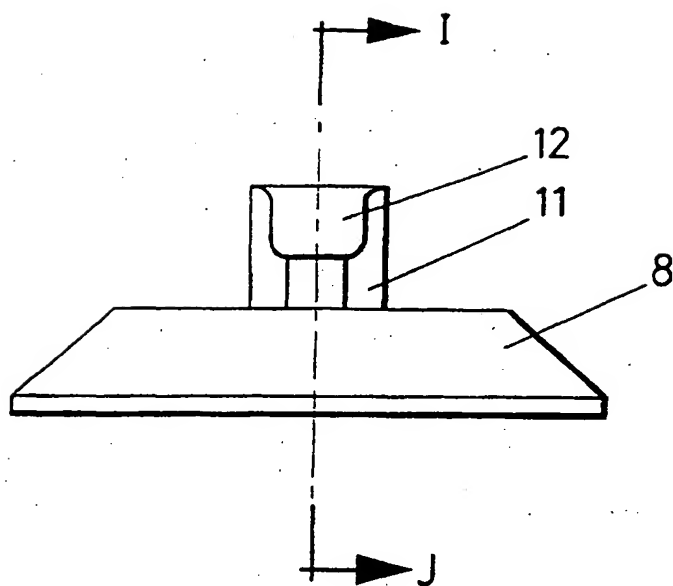
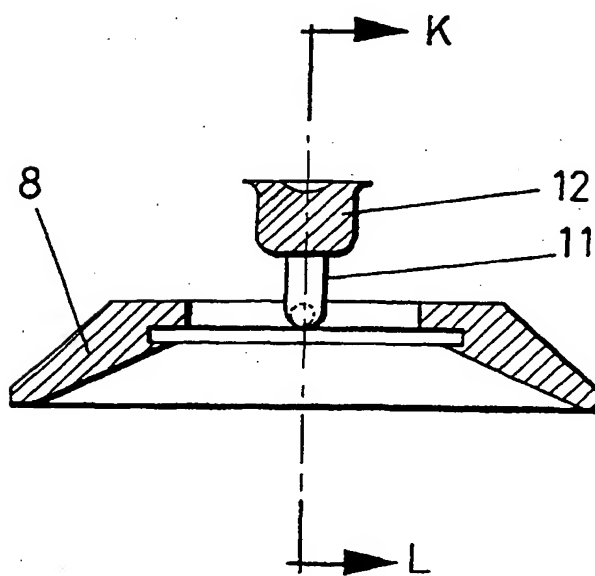
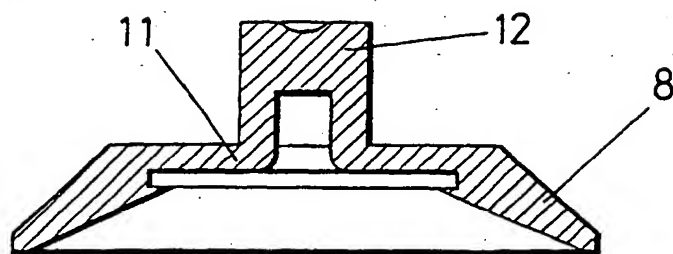


FIG. 6



I-J
FIG. 7



K-L
FIG.8

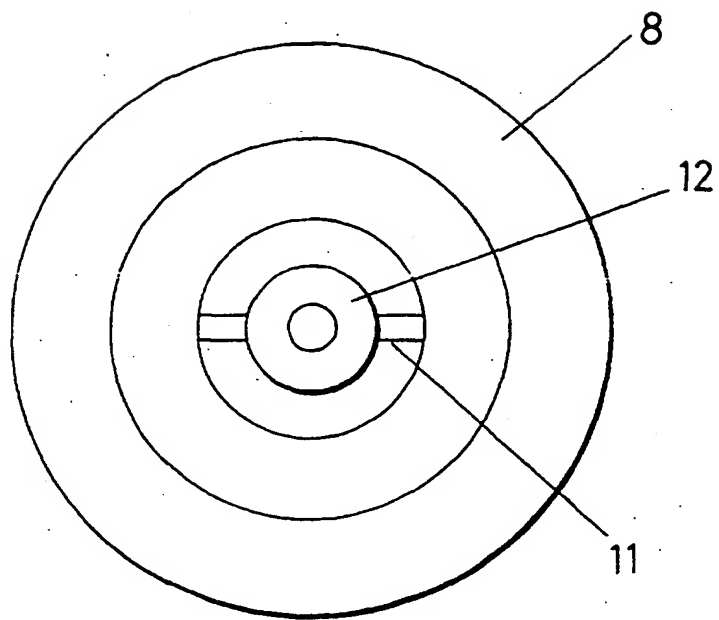


FIG.9

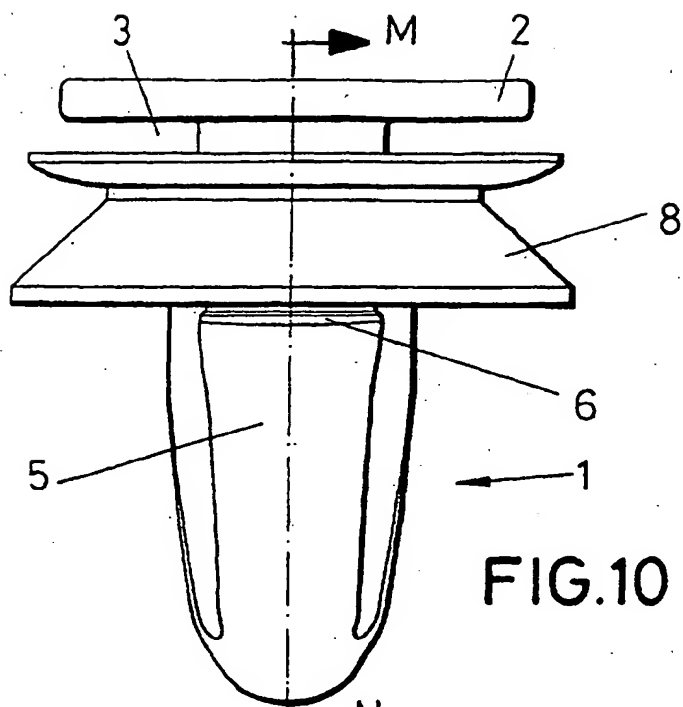
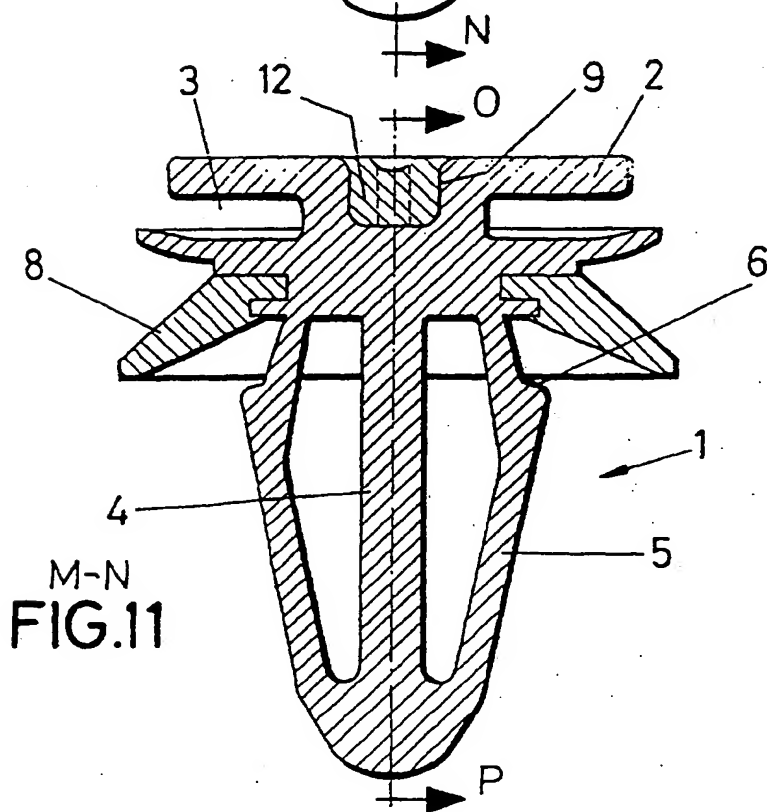
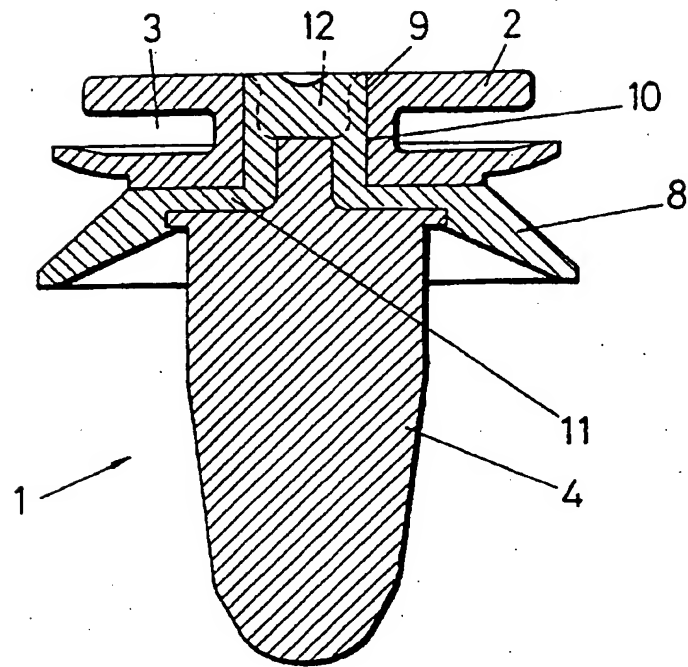


FIG.10



M-N
FIG.11



O-P
FIG.12

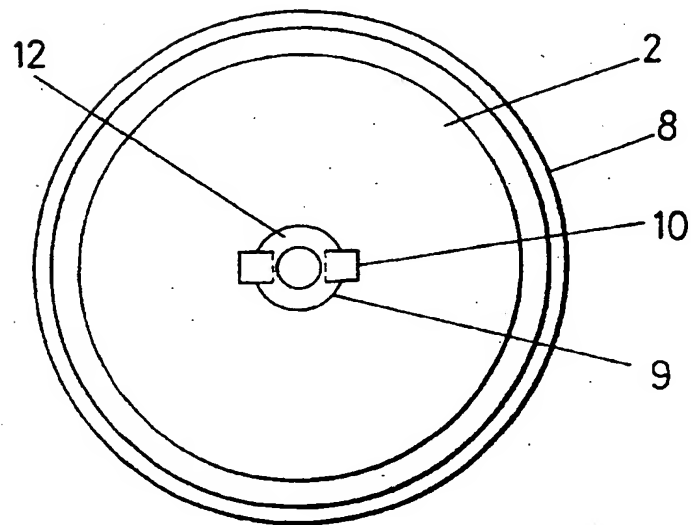


FIG.13

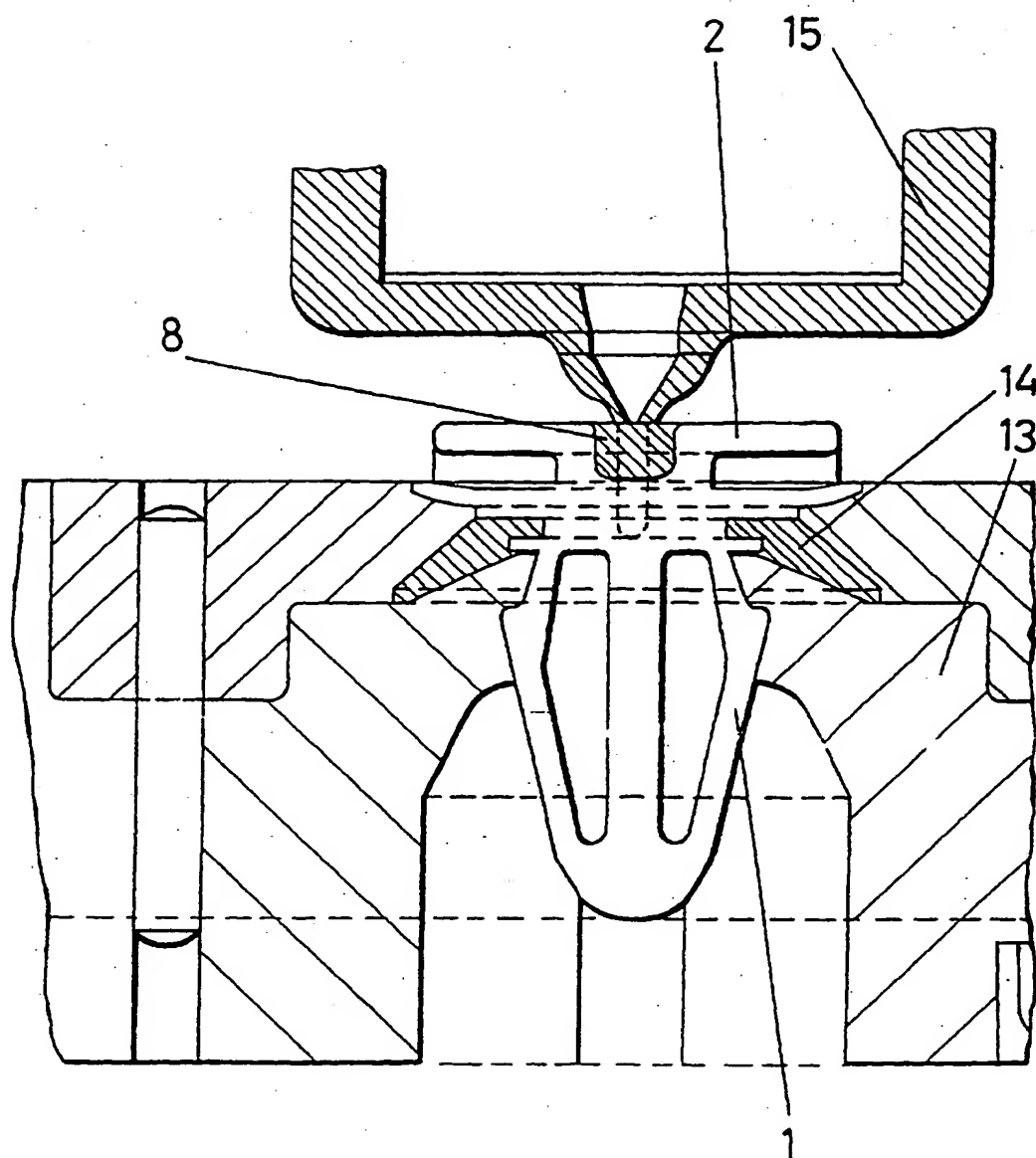


FIG.14

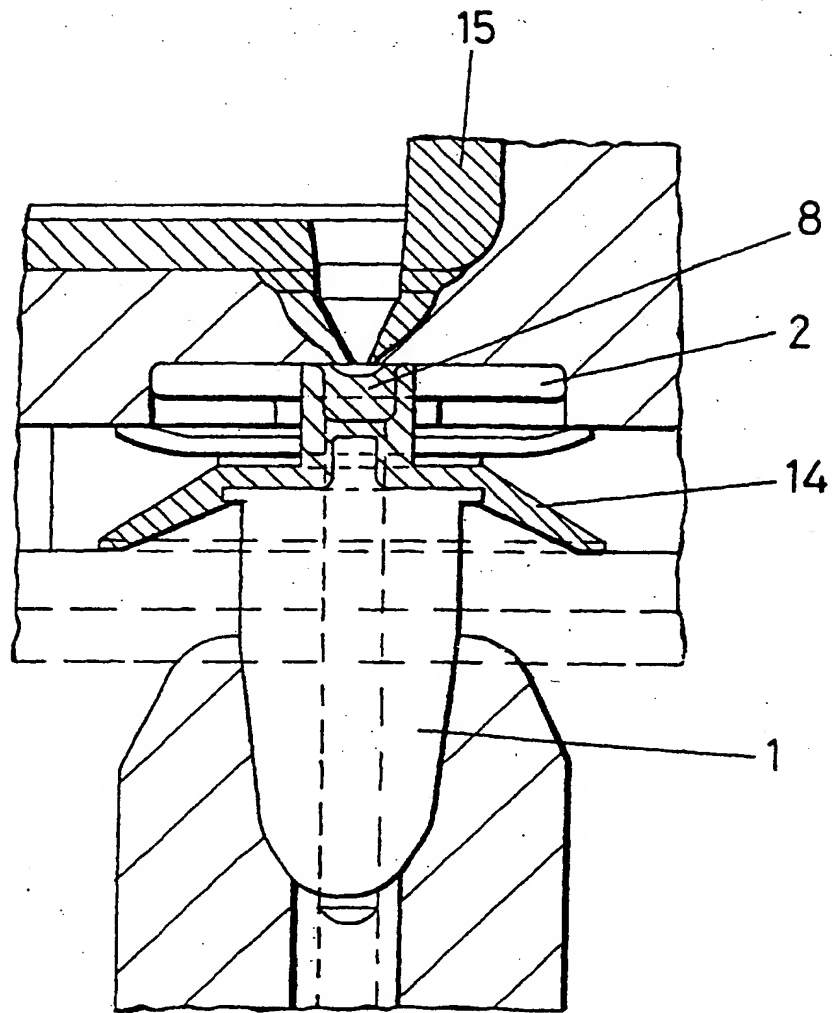


FIG.15

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES 99/00324

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 F16B 19/10, B29C 45/14, B60R 13/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7 F16B 5/06, F16B 21/08, F16B 19/10

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

CAJETINES O.E.P.M.

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CIBEPAT, EPODOC, PAJ, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 214 348 A (I.T.W. DE FRANCE) 09.08.1974 page 3, line 20- page 6, line 37; figures 1-4	1
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Y	GB 1 111 404 A (PLASCO, Ltd.) 24.04.1968 page 2, lines 103-113	1
A	page 1, line 82- page 2, line 59; figure 1	3
A	US 5 301 396 A (BENOIT) 12.04.1994 column 4, line 38 - column 5, line 32; figures 7-13	1-2
A	US 3 213 506 A (BIRGER) 26.10.1965 column 2, line 27- column 3, line 26; figures 1-8	1

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

28 January 2000 (28.01.00)

Date of mailing of the international search report

4 February 2000 (04.02.00)

Name and mailing address of the ISA/

Authorized officer

Facsimile No.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES 99/00324

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 122 583 A (GRITNER et al.) 31.10.1978 see the whole document.	I
A	DE 8 507 143 U (K.K.P. m.b.H.) 09.05.1985 figures 1-4	I

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT
 Information on patent family members

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Form PCT/ISA/210 (patent family annex) (July 1992)